(b) Amendments to the Claims

The following is a complete listing of the claims, and replaces all earlier versions and listings.

1. (Currently Amended) A lead zirconate titanate-based thin film, wherein the film is an epitaxial crystal thin film on a substrate, said thin film has a chemical composition represented by the general formula $Pb_{1-x}Ln_xZr_yTi_{1-y}O_3$, wherein Ln represents any one selected from the group consisting of lanthanum, lanthanoid elements, niobium, calcium, barium, strontium, iron, manganese and tin; and $0 \leq x \leq 1$, ~~$0.43 \leq y \leq 0.65$~~ $0.43 \leq y \leq 0.65$ and wherein the film orientation is {111} or within 15° from {111}.

2. (Cancelled)

3. (Previously Presented) The lead zirconate titanate-based thin film according to claim 1, wherein a half-width of a locking curve in the circumferential direction of an X-ray pole figure is within 30°.

4. (Previously Presented) The lead zirconate titanate-based thin film according to claim 1, wherein a half-width of a locking curve in the circumferential direction of an X-ray pole figure is within 15°.

5. (Previously Presented) The lead zirconate titanate-based thin film according to claim 1, wherein a half-width of a locking curve of the crystal is within 15°.

6. (Previously Presented) The lead zirconate titanate-based thin film according to claim 1, wherein a half-width of a locking curve of the crystal is within 5°.

7. (Previously Presented) The lead zirconate titanate-based thin film according to claim 1, wherein a half-width of a locking curve of the crystal is within 2°.

8. (Previously Presented) The lead zirconate titanate-based thin film according to claim 1, wherein a half-width of a locking curve of the crystal is within 1°.

9. (Previously Presented) A lead zirconate titanate-based thin film on a substrate, said thin film having a composition represented by the general formula $Pb_{1-x}Ln_xZr_yTi_{1-y}O_3$, wherein Ln represents any one selected from the group consisting of lanthanum, lanthanoid elements, niobium, calcium, barium, strontium, iron, manganese and tin; $0 \leq x < 1$; and $0.43 \leq y \leq 0.57$, wherein the relative permittivity - voltage characteristics of the film satisfy the following equation: $\Delta\varepsilon/\Delta E \geq 3.0$, wherein ΔE is a change in relative permittivity and $\Delta\varepsilon$ is a change in electric field strength (kv/cm).

10. (Original) The lead zirconate titanate-based thin film according to claim 9, wherein the relative permittivity - voltage characteristics satisfy the following equation: $\Delta\varepsilon/\Delta E \geq 5.0$.

11. (Currently Amended) The lead zirconate titanate-based thin film according to claim 9, wherein the film is an epitaxial film whose orientation is [[(111)]]

{111} or within 15° from [[(111)]] {111}.

12. (Previously Presented) The lead zirconate titanate-based thin film according to claim 1 or 11, wherein the {111} face of the epitaxial film is oriented within a tilt angle of 5°, including 0°.

13. (Previously Presented) The lead zirconate titanate-based thin film according to claim 1 or 11, wherein the {111} face of the epitaxial film is oriented within a tilt angle of 3°.

14. (Previously Presented) The lead zirconate titanate-based thin film according to claim 1 or 9, wherein the substrate is silicon.

15. (Currently Amended) The lead zirconate titanate-based thin film according to claim 14, wherein the silicon is [[(111)]] {111} oriented.

16. (Currently Amended) The lead zirconate titanate-based thin film according to claim 14, wherein the silicon is [[(111)]] {111} oriented.

17. (Previously Presented) The lead zirconate titanate-based thin film according to claim 1 or 9, wherein the film is formed by MOCVD.

18. (Original) The lead zirconate titanate-based thin film according to

claim 1, wherein in the general formula $Pb_{1-x}Ln_xZr_yTi_{1-y}O_3$, $0.43 \leq y \leq 0.57$.

19. (Original) The lead zirconate titanate-based thin film according to claim 1, wherein in the general formula $Pb_{1-x}Ln_xZr_yTi_{1-y}O_3$, $0.43 \leq y \leq 0.55$.

20. (Previously Presented) The lead zirconate titanate-based thin film according to claim 1 or 9, wherein the crystal structure is at least any one of tetragonal, cubic or rhombohedral crystals.

21. (Previously Presented) The lead zirconate titanate-based thin film according to claim 20, wherein at least any two of tetragonal, cubic or rhombohedral crystals coexist.

22. (Previously Presented) The lead zirconate titanate-based thin film according to claim 1 or 9, wherein at least a surface of the substrate is electrically conductive.

23. (Previously Presented) A lead zirconate titanate-based thin film, wherein the film is an epitaxial crystal thin film which has a chemical composition represented by the general formula $Pb_{1-x}Ln_xZr_{1-y}Ti_yO_3$, wherein Ln represents any one selected from the group consisting of lanthanum, lanthanoid elements, niobium, calcium, barium, strontium, iron, manganese and tin; and $0 \leq x < 1$, $0.40 \leq y \leq 0.65$, wherein the film orientation is {111} or within 15° from {111}, and in which at least any two of tetragonal,

cubic or rhombohedral crystals coexist.

24. (Original) The lead zirconate titanate-based thin film according to claim 23, wherein in the general formula $Pb_{1-x}Ln_x Zr_{1-y}Ti_yO_3$, $0.43 \leq y \leq 0.57$.

25. (Previously Presented) A lead zirconate titanate-based epitaxial thin film formed by MOCVD, wherein the film has a chemical composition represented by the general formula $Pb_{1-x} Ln_xZr_{1-y}Ti_yO_3$, wherein Ln represents any one selected from the group consisting of lanthanum, lanthanoid elements, niobium, calcium, barium, strontium, iron, manganese and tin; and $0 \leq x < 1$, $0.43 \leq y \leq 0.65$ and wherein the film orientation is {111} or within 15° of {111}.

26. (Original) A dielectric device, comprising the lead zirconate titanate-based thin film according to any one of claims 1, 9, 23 and 25.

27. (Original) A piezoelectric device, comprising the lead zirconate titanate-based thin film according to any one of claims 1, 9, 23 and 25.

28. (Original) An ink jet printer head, comprising the piezoelectric device according to claim 27.

29. (Original) A ferroelectric device, comprising the lead zirconate titanate-based thin film according to any one of claims 1, 9, 23 and 25.

30. (Original) A pyroelectric device, comprising the lead zirconatc titanate-based thin film according to any one of claims 1, 9, 23 and 25.

31-33. (Cancelled)

34. (Currently Amended) A lead zirconate titanate-based thin film, wherein the film is a crystal thin film which has a chemical composition represented by the general formula $Pb_{1-x}Ln_xZr_{1-y}Ti_yO_3$, wherein Ln represents any one selected from the group consisting of lanthanum, lanthanoid elements, niobium, calcium, barium, strontium, iron, manganese and tin; and $0 \leq x < 1$, $0.40 \leq y \leq 0.65$[[)]], wherein the film orientation is {111} is or within 15° of {111} and in which at least any two of tetragonal, cubic or rhombohedral crystals coexist.